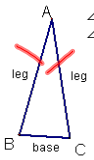
4.6 Isosceles Triangle Theorem

ΔABC is isosceles

$\overline{AB} \cong \overline{AC}$

Isosceles Δ Theorem-(Theorem 4.9) If 2 sides of a Δ are ≅, then the angles opposite those sides are ≅.

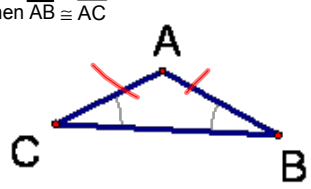
Since $\overline{AB} \cong \overline{AC}$, then ∠C ≅ ∠B



∠A is the vertex angle
∠B and ∠C are the base angles

The Converse of the Isosceles ΔTheorem-(Theorem 4.10) If 2 angles of a Δ are ≅, then the sides opposite those angles are ≅.

Since ∠C ≅ ∠B, then $\overline{AB} \cong \overline{AC}$



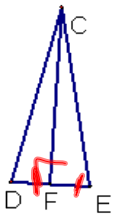
Corollary 4.3-A Δ is equilateral iff it is equiangular

Corollary 4.4-Each angle of an equilateral Δ measures 60°.

*****The altitude of an isosceles Δ is ⊥ to the base at its midpoint.**

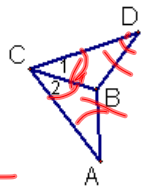
If $\overline{CF}$ is the altitude from the vertex angle, then DF = FE and m∠CFE = 90°

Why? ΔDFC ≅ ΔEFC by HL



Proof Examples:

Given: ~~AB = CB = BD~~
$\angle 2 \cong \angle 1$
Prove: $\angle A \cong \angle D$



S.	R.
① ≅	
② $\angle 2 \cong \angle A$	② Isos $\triangle$ thm Isth ITT
$\angle 1 \cong \angle D$	
③ $\angle A \cong \angle D$	③ Subst.

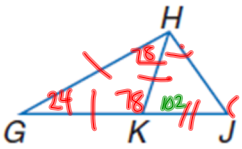
In the figure, $\overline{GK} \cong \overline{GH}$ and $\overline{HK} \cong \overline{KJ}$.

$m\angle G = 24$

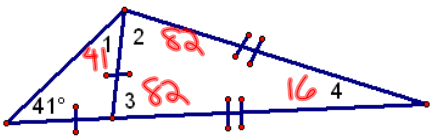
$m\angle J =$ 37°

180
−24
156 ÷ 2 = 78

78 ÷ 2



Find the measures of the numbered angles.



m∠1 = 41
m∠3 = 82 41+41
m∠2 = 82

HW
p219-220 #s 9-14, 19-26